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BRINKS HOFER GILSON & LIONE P.O. BOX 10395 CHICAGO, IL 60611			DUONG, THO V	
			ART UNIT	PAPER NUMBER
			3743	

DATE MAILED: 02/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/034,333

Applicant(s)

HONG ET AL.

Examiner

Tho v Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 and 30-32 is/are pending in the application.
- 4a) Of the above claim(s) 28 and 30-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4 and 5</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Claims 28 and 30-32 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected group, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 8.

Applicant's election with traverse of group II in Paper No. 8 is acknowledged. The traversal is on the ground(s) that the heat exchanger as claimed cannot be used as suggested by the examiner due to the fact that heat transfer between fluids would not occur. This is not found persuasive because heat transfer between two fluids occurs through conduction regardless of what fluid is inside the tube and what fluid is outside the tube.

The requirement is still deemed proper and is therefore made FINAL.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed subject matter of "wherein a second portion of said spiral tubing contacts both said first wall and said second wall" must be shown or the feature(s) canceled from claim 3. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: the reference "Z" is mentioned on page 6, line 6, in the specification. A proposed drawing correction or corrected

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drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the claimed subject matter of “wherein a second portion of said spiral tubing contacts both said first wall and said second wall” is not described in the specification.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification fails to provide an adequate written description of the claimed subject matter “wherein a second portion of said spiral tubing contacts both said first wall and said second wall”.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As regarding claim 1, it is not clear what the expression “a first perimeter in a plane that is perpendicular to said first direction” is intended to comprise since the perimeter of the wall may also comprises wall that extends in a first direction. The phrase “a bottom attached to a bottom portion of said first wall and a bottom portion of said second wall” renders the scope of the claim indefinite since figure 4 discloses that the bottom 112 is only attached to a portion of the second wall and it is the step 119 which is attached to the first wall.

As regarding claim 3, the claimed subject matter of “ wherein a second portion of said spiral tubing contacts both said first wall and said second wall” renders the scope of the claim indefinite since applicant already claims in claim 1 that gaps are formed between the first and second wall with the portion of the tube positioned nearest to the walls. Therefore, the metes and bound of the claimed subject matter cannot to be determined.

As regarding claims 11-12, the claimed subject matter of “adjacent spiral tubing” renders the scope of the claim indefinite since it appears to suggest that there is more than one spiral tubing. However, it is disclosed in the disclosure that there is only one spiral tubing. Furthermore, the claimed subject matter that “the first gap and the second gaps are varied” renders the scope of the claimed indefinite since as the final product of a heat exchanger, the sizes of the first gap and the second gap are fixed and the distance between adjacent spiral tubes is also fixed. Therefore, it is not clear about the metes and bound of the claimed subject matter.

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As regarding claim 26, the claimed subject matter of “J-tube” renders the scope of the claim indefinite since it is not clear what the J-tube is.

As regarding claim 27, the claimed subject matter of “first component” and “second component of the second fluid” renders the scope of the claim indefinite since only “vapor” component flows along an exterior of the tubing (104) and the first and second gaps are also external to the tubing.

As regarding claim 21-23, the claim subject matter of “the group consisting of CO<sub>2</sub> and R134a” renders the scope of the claim indefinite since the claim appears to suggest the combination of CO<sub>2</sub> and R134a. It appears that it is intended to read as “CO<sub>2</sub> or R134a” as described through the description, e.g. page 8, line 13.

Applicant is reminded that the relevant text of the specification should be made fully consistent with the invention as finally claimed.

In view of the rejections above, the examiner have not been able to determined whether claim 3 is new or inventive .

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2,7,9-23 and 27 are rejected under 35 U.S.C. 102(a) as being anticipated by Tawney et al. (US 6,293,335). Tawney discloses (figures 3 and 5-6) a heat exchanger

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comprising a first cylindrical wall (12) that extends along a first direction and defines a first perimeter in a plane that is perpendicular to the first direction; a second cylindrical wall (30) that defines a second perimeter and is coaxially positioned within the first perimeter, wherein the first wall (12) and the second wall (30) are spaced from one another so as to defined a volume of space (33) there between; a lid (22) attached to a top portion of the first wall and a top portion of the second wall; a bottom (20) attached to a bottom portion of the first wall and a bottom portion of the second wall; a spiral titanium tubing (35) positioned within the volume of space, wherein the spiral tubing entirely fails to contact either the first wall and the second wall so that gaps are formed between the tubes (35) and the walls; and a first fluid that flows within the spiral tubing and a second fluid that flows within the first and second gaps are in an opposite direction.

Tawney further discloses (figure 6) that the gaps appear to be equal on both side of the tube. As regarding claims 16-18 and 21-23, a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647. (See MPEP 2114) Further stated in Ex parte Masham, “ a recitation with respect to the material intended to be worked upon by a claimed apparatus does not impose any structural limitations upon the claimed apparatus which differentiates it from a prior art apparatus satisfying the structural limitations of that claims.” In this case, the conditions and the material of the first fluid and second fluids intended to be worked upon by the claimed heat exchanger does not impose any structural limitations or require any additional structures to that of Tawney. As regarding claims 9 and 10, the functional recitation that “to reduce pressure drop without adversely affecting heat exchange performance

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or to maximize heat exchanging” has not been given any significant patentable weight because claims directed to an apparatus must be distinguished from prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (See MPEP 2114). Furthermore, it is inherently that Tawney’s gaps are to reduce pressure drop since some of the fluid are allowed to bypass in axial flow path.

Claims 1-2,7,9-25 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Dempsey (US 5,379,832). Dempsey discloses (figures 1-3, 7-8 and 11-12) a heat exchanger employed in a refrigeration system comprising a first cylindrical wall (28) that extends along a first direction and defines a first perimeter in a plane that is perpendicular to the first direction; a second cylindrical wall (30) that defines a second perimeter and is coaxially positioned within the first perimeter, wherein the first wall (28) and the second wall (30) are spaced from one another so as to defined a volume of space (36) there between; a lid (32) attached to a top portion of the first wall and a top portion of the second wall; a bottom (34) attached to a bottom portion of the first wall and a bottom portion of the second wall; a spiral copper tubing (24 or 84) positioned within the volume of space connected with a gas cooler or a condenser (70), wherein the spiral tubing entirely fails to contact either the first wall and the second wall so that gaps (AX) of sizes less than 0.005 inch are formed between the tubes (24) and the walls; and a first fluid that flows within the spiral tubing and a second fluid such as a refrigerant that flows within the first and second gaps are in an opposite direction. As regarding claims 16-18 and 21-23, a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2



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USPQ2d 1647. (See MPEP 2114) Further stated in Ex parte Masham, “ a recitation with respect to the material intended to be worked upon by a claimed apparatus does not impose any structural limitations upon the claimed apparatus which differentiates it from a prior art apparatus satisfying the structural limitations of that claims.” In this case, the conditions and the material of the first fluid and second fluids intended to be worked upon by a claimed apparatus such as a heat exchanger does not impose any structural limitations or require any additional structures to that of Dempsey. As regarding claims 9 and 10, the functional recitation that “to reduce pressure drop without adversely affecting heat exchange performance or to maximize heat exchanging” has not been given any significant patentable weight because claims directed to an apparatus must be distinguished from prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429,1431-32 (Fed. Cir. 1997) (See MPEP 2114). Furthermore, it is inherently that Dempsey’ gaps are to reduce pressure drop since some of the fluid are allowed to bypass in axial flow path.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dempsey in view of Ecker (US 4,217,765). Dempsey substantially discloses all of applicant’s claimed invention as discussed above except for the limitation of a J-tube having one end in fluid communication with the space between inner and outer walls. Ecker discloses (figure 2 and column 4, lines 20-

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36) discloses a heat exchanger (11) employed in a refrigeration system comprising an inner wall (17), an outer wall (27) and a spiral tube (19) disposed within a space formed between the inner wall and outer wall for exchanging heat between a first fluid flowing inside the tubes and a refrigerant flowing through the space and the heat exchanger further has a J-tube having one end (41,43) in fluid communication with the space for purposing of separating refrigerant liquid from refrigerant gas stream so that heat transfer of the heat exchanger is enhanced.

Since Dempsey and Ecker are both from the same field of endeavor and/or analogous art, the purpose disclosed by Ecker would have been recognized in the pertinent art of Dempsey. It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ in Ecker's teaching for the purpose of separating refrigerant liquid from refrigerant gas stream so that heat transfer of the heat exchanger is enhanced.

#### ***Allowable Subject Matter***

Claims 4-6 and 8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the applicant has disclosed criticalities and unexpected results in the specification for the range of gaps as claimed.

#### ***Conclusion***

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The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Schumacher (US 3,955,375) discloses a combination liquid trapping suction accumulator and a heat exchanger.

Jacobsen (US 4,498,524) discloses a heat exchanger with by-pass.

Romero (US 5,487,423) discloses a heat exchanger that has tubes disposed inside between two tubular walls.

Newton (US 4,257,479) discloses a shell and coil heat exchanger.

Filho et al. (US 6,613,281) discloses an integrated heat exchanger/reservoir.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Tho Duong whose telephone number is (703) 305-0768. The examiner can normally be reached on from 9:30-6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennet, can be reached on (703) 308-0101. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0861.



TD

January 30, 2004



Tho Duong

Patent Examiner.